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XI.
EXPLORATIONS IN THE ALEUTIAN ISLANDS AND
THEIR VICINITY.

BY WILLIAM H. DALL, OF THE U. S. COAST SURVEY.

COMMUNICATED.

SAN FRANCISCO, Cal., *Dec. 5th*, 1873.

DEAR SIR,—Your letter of November 25th is at hand. In reply to it, I am able to state that the party under my charge, under the direction of the Superintendent of the United States Coast Survey, has been engaged since August, 1871, in reconnoissance work in the Aleutian Islands, with the exception of the winter of 1872-3, which was spent in refitting in San Francisco. The liberality of the Superintendent's instructions has allowed me a certain amount of discretion in the work to be attempted, an elasticity necessary in the very adverse conditions of weather under which we are obliged to carry on the work.

Since the authorization of the explorations, careful observations have been continuously kept up of the meteorology, specific gravity, and temperatures of the sea-water at the surface and at various depths, and observations for the determination of the nature and direction of the oceanic currents of the North Pacific, and of the tides of the Aleutian Islands. Our work in the past season in these particulars has been simply a continuation and confirmation of the observations and results of the seasons of 1871-2. The most important result of these observations has been the determination of the existence, and the rate, dimensions, direction, and temperature, of a recurving branch of the great easterly North Pacific stream which abuts on the coast of North-western America near Dixon's Entrance, and continues trending with the coast in a northerly and then westerly and south-westerly direction south of the islands. No definite current has been shown to exist in the eastern part of Behring Sea. The tides have been determined to be of a compound

and very complex character throughout, the chain rising invariably from the east towards the west, and causing heavy rips and bores in the narrow channels between the islands. The climate is mild and uniform, not so cold as that of Philadelphia, though fogs and rain are very prevalent and sudden, and severe storms are prevalent during the winter and equinoctial periods. The barometer is subject to many and extreme fluctuations; and its relation to the weather, especially in the western islands, is yet but slightly understood. The thermometer rarely descends as low as $+8^{\circ}$ Fahr.; indeed, we have never experienced anything lower than $+11^{\circ}$, and that only once.

The work includes hydrographic, geodetic, and topographical surveys of harbors and their vicinity, reconnoissance-charts of groups of islands, and the determination of magnetics and latitude and time wherever practicable. Such work has been done this season at Attù, Kyska, the Dávidoff Islands, Amchitka, Adakh, Atka, Unalashka, and the Shumagins. A careful survey of the harbor of Kyska was made with reference to the facilities afforded by it as a landing station for the Japan cable, should it be decided to take it that way. Nearly all the other harbors in the islands were examined with reference to the same question, and this appears to furnish all the requirements, and to be the only one which does so. The magnetic variation obtained at many stations differed widely from the old surveys, and it was found that the easterly variation appears to be on the decrease and changing with some rapidity. The island of Amchitka was found to be very erroneously located on the latest charts, as were the Dávidoff Islands and the islands of Four Craters. The celebrated volcanic island of Bogostoff (Ioanna Bogostova, or St. John the Theologian of the Russians and Agashagok of the Aleuts) was found to be much further north than supposed, and the reef supposed to connect it with Uinnak (and delineated on most charts) has no existence. We obtained 800 fathoms and no bottom where it was supposed to be.

A chart of the Shumagins containing eight islands, fourteen anchorages and many dangers, hitherto unrepresented on the chart, was one of the results of the season of 1871-2. This was still further improved during the past season. Five harbors and one strait have been carefully surveyed and sounded, and tolerably accurate sketches made of as many more. The eastern and southern extension of the celebrated Sannakh Reefs (Halibut Island of Cook) were determined. Several new cod-banks offshore have been discovered and located.

Deep-sea soundings have been taken whenever the weather per-

mitted north of the islands, and these entirely change the complexion of the western half of Behring Sea. The shallow plateau of that sea has its south-westerly termination (in 60 fathoms) at the north-westerly end of Unalashka, when it drops down to about 1,000 fathoms very suddenly. The water is very deep, and the bottom rocky and irregular close to and north of the islands west of Unalashka. Our deepest was about 1,100 fathoms, and no bottom at that depth. Recent chalk or Globigerina ooze was found in process of formation in 800 fathoms.

Considering the size of our party, which includes only three officers directly engaged in scientific work, and that our vessel is of less than 100 tons burden, we do not feel that the results hitherto have proved inadequate returns for the expenditures incurred by the government, especially as we get less than one day suitable for surveying work in every three of the season, comprising about five months of the year.

During the leisure enforced by bad weather, collections for the National Museum in archæology and natural history were made with interesting results. This season we obtained thirty-six prehistoric crania from caves, and many hundred bone and stone implements and carvings. The results of the natural-history collections show that the fauna and flora do not exhibit Asiatic influences as we go westward, but become more Arctic and meagre in their character, until, on the westernmost island, they are almost wholly Arctic or Boreal. The collections have great value as exhibiting more thoroughly than any previously made the history of the geographical distribution of life in that region.

Trusting that you may be able to cull from this *résumé* such information as may be of value to the Society and interesting to geographers, I remain,

Very truly yours,

WM. H. DALL,

Actg. Asst. U. S. Coast Survey, in charge Alaska Survey.

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